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(54) Alpha-unsaturated amines, their production and use.

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EP-A- 0 092 647
EP-A- 0 164 040
EP-A- 0 254 859
DE-A- 3 232 462
DE-A- 3 343 884

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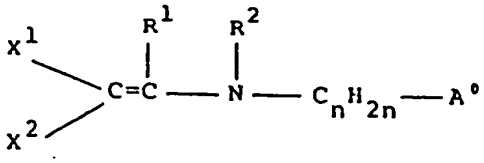
Claims

Claims for the following Contracting States : AT, BE, CH, DE, FR, GB, GR, IT, LI, LU, NL, SE

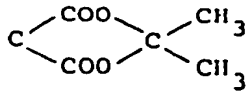
1. An α-unsaturated amine of the formula:



[I°]

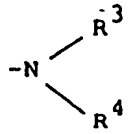
wherein:

one of X^1 and X^2 is an electron-attracting group and the other is a hydrogen atom or an electron-attracting group, wherein the said electron-attracting group is cyano, nitro, C_{1-4} alkoxy carbonyl, carboxyl, C_{6-10} aryloxy-carbonyl, heterocycleoxycarbonyl, C_{1-4} alkylsulfonyl which may be substituted with halogen, aminosulfonyl, di-C_{1-4} alkoxyphosphoryl, C_{1-4} alkanoyl which may be substituted with halogen, C_{1-4} alkylsulfonylthiocarbamoyl, carbamoyl or halogen, or X^1 and X^2 together with the carbon atom to which they are attached form a ring of the formula:



;

R^1 is a group of the formula:

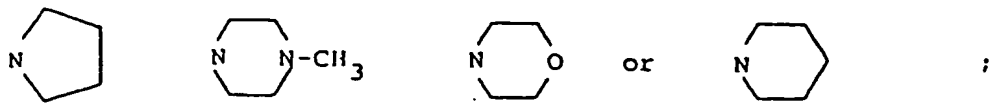


in which:

R^3 is hydrogen, C_{1-20} alkyl, C_{6-10} aryl, C_{7-9} aralkyl, heterocycle, C_{1-4} alkanoyl, C_{6-10} aryl-carbonyl, C_{1-4} alkoxy-carbonyl, C_{6-10} aryloxy-carbonyl, heterocycleoxycarbonyl, C_{6-10} arylsulfonyl, C_{1-4} alkylsulfonyl, di-C_{1-4} alkoxyphosphoryl, C_{1-4} alkoxy, hydroxy, amino, di-C_{1-4} alkylamino, C_{1-4} alkanoylamino, C_{1-4} alkoxycarbonylamino, C_{1-4} alkylsulfonylamino, di-C_{1-4} alkoxyphosphorylamino, C_{7-9} aralkyloxy or C_{1-4} alkoxy-carbonyl-C_{1-4} alkyl; and

R^4 is hydrogen, C_{1-20} alkyl, C_{3-6} cycloalkyl, C_{2-6}-alkenyl, C_{3-6} cycloalkenyl or C_{2-6} alkynyl, wherein each of the radicals defined for R^4 except for hydrogen may optionally be substituted by 1 to 3 substituents selected from the group consisting of hydroxy, C_{1-4} alkoxy, halogen, di-C_{1-4} alkylamino, C_{1-4} alkylthio, C_{1-3} alkanoylamino, C_{1-4} alkylsulfonylamino, tri-C_{1-4} alkylsilyl, pyridyl and thiazolyl, and each of the pyridyl and thiazolyl may further be substituted by halogen, or

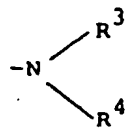
R^3 and R^4 together with the adjacent nitrogen atom constitute a cyclic amino group of the formula:



;

R^2 is (1) hydrogen, (2) a group attached through a carbon atom selected from the class consisting of C_{1-4} alkanoyl, C_{1-20} alkyl, C_{2-6} alkenyl, C_{3-6} cycloalkyl, C_{6-10} aryl, C_{7-9} aralkyl and 3- or 4-

pyridyl, the said group attached through a carbon atom being optionally substituted by 1 to 3 substituents selected from the class consisting of C_{1-4} alkylthio, C_{1-4} alkoxy, mono- or di-C_{1-4} alkylamino, C_{1-4} alkoxy-carbonyl, C_{1-4} alkylsulfonyl, halogen and C_{1-4} alkanoyl, (3) a group attached through an oxygen atom selected from the class consisting of C_{1-4} alkoxy, C_{3-6} cycloalkoxy, C_{2-4} alkenyloxy, C_{3-6} cycloalkenyloxy, ethynyloxy, C_{6-10} aryloxy, thienyloxy and hydroxy, the said group attached through an oxygen atom being optionally substituted by 1 to 3 substituents selected from the class consisting of halogen and phenyl, or (4) a group attached through a nitrogen atom of the formula:



wherein

R^3 and R^4 have the meanings given above;

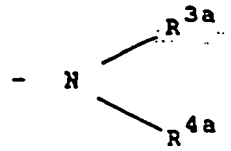
n is an integer of 0, 1 or 2;

$\overline{A}^{\circ}$ is heterocycle;

wherein the heterocycle in the said heterocycle carbonyl for X^1 and X^2, the said heterocycle for R^3, the heterocycle in the said heterocycleoxycarbonyl for R^3,
and the said heterocycle for A° are a member selected from the class consisting of thienyl, furyl, pyrrolyl, pyridyl, oxazolyl, thiazolyl, pyrazolyl, imidazolyl, isoxazolyl, isothiazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, N-oxidopyridyl, pyrimidinyl, N-oxidopyrimidinyl, pyridazinyl, pyrazinyl, N-oxidopyridazinyl, benzofuryl, benzothiazolyl, benzoxazolyl, triazinyl, oxotriazinyl, tetrazo[1,5-b]-pyridazinyl, triazolo[4,5-b]pyridazinyl, oxoimidazinyl, dioxotriazinyl, pyrrolidinyl, piperidinyl, pyranyl, thiopyranyl, 1,4-oxazinyl, morpholinyl, 1,4-thiazinyl, 1,3-thiazinyl, piperazinyl, benzimidazolyl, quinolyl, isoquinolyl, indolizinyl, quinolizinyl, 1,8-naphthyridinyl, purinyl, pteridinyl, dibenzofuranyl, carbazolyl, acridinyl, phenanthridinyl, phenazinyl, phenothiazinyl and phenoxazinyl, the said heterocycle being optionally substituted by 1 to 5 substituents selected from the group consisting of:

(i) C_{1-4} alkyl,
(ii) C_{3-6} cycloalkyl,
(iii) C_{6-10} aryl,
(iv) C_{1-4} alkoxy,
(v) C_{3-6} cycloalkyloxy,
(vi) C_{6-10} aryloxy,
(vii) C_{7-12} aralkyloxy
(viii) C_{1-4} alkylthio,
(ix) C_{3-6} cycloalkylthio,
(x) C_{6-10} arylthio,
(xi) C_{7-12} aralkylthio,
(xii) mono-C_{1-4} alkylamino,
(xiii) di-C_{1-4} alkylamino,
(xiv) C_{3-6} cycloalkylamino,
(xv) C_{6-10} arylamino,
(xvi) C_{7-12} aralkylamino,
(xvii) halogen,
(xviii) C_{1-4} alkoxycarbonyl,
(xix) C_{6-10} aryloxycarbonyl,
(xx) C_{3-6} cycloalkyloxycarbonyl,
(xxi) C_{7-12} aralkyloxycarbonyl,
(xxii) C_{1-5} alkanoyl,
(xxiii) C_{1-15} alkanoyloxy,
(xxiv) carbamoyl, N-methylcarbamoyl, N,N-dimethylcarbamoyl, N-ethylcarbamoyl, N,N-diethylcarbamoyl N-phenylcarbamoyl, pyrrolidinocarbamoyl, piperidinocarbamoyl, piperazinocarbamoyl, morpholinocarbamoyl or N-benzylcarbamoyl,

(xxv) N-methylcarbamoyloxy, N,N-dimethylcarbamoyloxy, N-ethylcarbamoyloxy, N-benzylcarbamoyloxy, N,N-dibenzylcarbamoyloxy or N-phenylcarbamoyloxy,
(xxvi) C_{1-4} alkanoylamino,
(xxvii) C_{6-10} arylcarbonylamino,
(xxviii) C_{1-4} alkoxycarbonylamino,
(xxix) C_{7-12} aralkyloxycarbonyl,
(xxx) methanesulfonylamino, ethanesulfonylamino, butanesulfonylamino, benzenesulfonylamino, toluenesulfonylamino, naphthalenesulfonylamino, trifluoromethanesulfonylamino, 2-chloroethanesulfonylamino or 2,2,2-trifluoromethanesulfonylamino,
(xxxi) pyrrolidinyl, pyrrolyl, pyrazolyl, imidazolyl, furyl, thienyl, oxazolyl, isoxazolyl, isothiazolyl, thiazolyl, piperidinyl, pyridyl, piperazinyl, pyrimidinyl, pyranyl, tetrahydropyranyl, tetrahydrofuryl, indolyl, quinolyl, 1,3,4-oxadiazolyl, thieno[2,3-d]pyridyl, 1,2,3-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,3,4-triazolyl, tetrazolyl, 4,5-dihydro-1,3-dioxazolyl, tetrazolo[1,5-b]-pyridazinyl, benzothiazolyl, benzoxazolyl, benzimidazolyl or benzothienyl,
(xxxii) heterocyclethio, heterocycleoxy, heterocycleamino or heterocyclecarbonylamino group which is derived by attachment of any of the heterocyclic groups (xxxi) defined above to the S, O, N atom or a carbonylamino group,
(xxxiii) di-C_{1-4} alkylphosphinothioylamino,
(xxxiv) methoxyimino, ethoxyimino, 2-fluoroethoxyimino, carboxymethoxyimino, 1-carboxy-1-methylethoxyimino, 2,2,2-trichloroethoxycarbonylmethoxyimino, 1-(2,2,2-trichloroethoxycarbonyl)-1-methylethoxyimino, (2-aminothiazol-4-yl)methoxyimino or (1H-imidazol-4-yl)methoxyimino,
(xxxv) C_{1-4} alkylsulfonyloxy,
(xxxvi) C_{6-10} arylsulfonyloxy,
(xxxvii) di-C_{6-10} arylphosphino-thioylamino,
(xxxviii) thiocarbamoylthio, N-methylthiocarbamoylthio, N,N-dimethylthiocarbamoylthio, N-ethylthiocarbamoylthio, N-benzylthiocarbamoylthio, N,N-dibenzylthiocarbamoylthio or N-phenylthiocarbamoylthio,
(xxxix) trimethylsilyloxy, t-butyldimethylsilyloxy, t-butyldiphenylsilyloxy or dimethylphenylsilyloxy,
(xL) trimethylsilyl, t-butyldimethylsilyl, t-butyldiphenylsilyl or dimethylphenylsilyl,
(xLi) C_{1-4} alkylsulfinyl,
(xLii) C_{6-10} arylsulfinyl,
(xLiii) C_{1-4} alkylsulfonyl,
(xLiv) C_{6-10} arylsulfonyl,
(xLv) C_{1-4} alkoxy-carbonyloxy,
(xLvi) halo-C_{1-4} alkyl,
(xLvii) halo-C_{1-4} alkoxy, halo-C_{1-4} alkylthio, halo-C_{1-4} alkylsulfinyl or halo-C_{1-4} alkylsulfonyl,
(xLviii) cyano, nitro, hydroxyl, carboxyl, sulfo, phosphono,
(xLix) C_{1-4} alkyloxysulfonyl,
(L) C_{6-10} aryloxysulfonyl,
(Li) C_{7-12} aralkyloxysulfonyl, and
(Lii) di-C_{1-4} alkyloxyphosphoryl group, with the proviso that when R^2 is a hydrogen atom, R^1 is a group of the formula:



[wherein R^{3a} is hydrogen, C_{1-4} alkyl, C_{7-9} phenylalkyl or C_{1-4} alkanoyl and R^{4a} is a hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy-C_{1-4} alkyl, (di-C_{1-4} alkylamino)-C_{1-4} alkyl, tri-C_{1-4} alkylsilyl-C_{1-4} alkyl, C_{2-4} alkenyl or pyridyl- or thiazolyl-C_{1-2} alkyl wherein pyridyl or thiazolyl moiety may optionally be substituted with a halogen atom, or R^{3a} and R^{4a} taken together with the adjacent nitrogen atom constitute pyrrolidino) and A^o is pyridyl, pyrazinyl or thiazolyl, each of which may optionally be substituted with a halogen, C_{1-4} alkyl, C_{1-4} alkylthio or C_{1-4} alkoxy),

and with the proviso that when

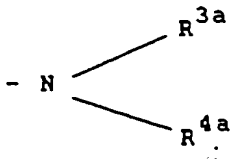
$$\begin{matrix} X^1 \\ X^2 \end{matrix} > C =$$

is $O_2N\text{-}CH=$;
R^1 is

$$-\underset{\underset{R^4}{|}}{N}-R^3 \quad ;$$

R^3 is hydrogen, C_{1-5} alkyl or C_{3-6} cycloalkyl;
R^4 is hydrogen, C_{1-5} alkyl, C_{3-6} cycloalkyl, benzyl or pyrimidinylmethyl; or
R^3 and R^4 together with the adjacent nitrogen atom constitute a cyclic amino group of pyrrolidinyl or piperazinyl; and
R^2 is hydrogen, C_{1-5} alkyl or C_{3-6} cycloalkyl,
A^0 is not a pyridyl subsituted by C_{1-4} haloalkyl, C_{1-4} haloalkoxy, C_{1-4} haloalkylthio, C_{1-4} haloalkylsulfinyl, C_{1-4} haloalkylsulfonyl, cyano, nitro or hydroxyl,
or a salt thereof.

2. A compound as claimed in claim 1, wherein R^2 is hydrogen, R^1 is a group of the formula:



(wherein R^{3a} and R^{4a} are as defined in claim 1) and A^0 is heterocycle selected from the class consisting of pyridyl, pyrazinyl and thiazolyl, the said heterocycle mentioned just above for A^0 being optionally substituted with halogen, C_{1-4} alkyl, C_{1-4} alkylthio or C_{1-4} alkoxy.

3. A compound as claimed in claim 1, wherein R^2 is other than hydrogen.

4. A compound as claimed in claim 1, wherein,
X^1 is nitro;
X^2 is hydrogen, C_{1-2} alkoxycarbonyl or C_{1-2} alkylsulfonylthiocarbamoyl;
R^1 is amino, mono- or di-C_{1-4} alkylamino, halo-C_{1-4} alkylamino, N-C_{1-4} alkyl-N-C_{1-2} alkanoylamino, N-halo-C_{1-4} alkyl-N-C_{1-2} alkanoylamino or C_{1-2} alkanoylamino;
R^2 is hydrogen, C_{1-2} alkoxy, di-C_{1-2} alkylamino, C_{1-4} alkyl, halo-C_{1-4} alkyl or C_{1-2} alkanoyl;
n is 0 or 1;
A^0 is 2- or 3-thienyl, 2- or 3-furyl, 2- or 3-pyrrolyl, 2-, 3- or 4-pyridyl, 2-, 4- or 5-oxazolyl, 2-, 4- or 5-thiazolyl, 3-, 4- or 5-pyrazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-isoxazolyl, 3-, 4- or 5-isothiazolyl, 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 4- or 5-(1,2,3-thiadiazolyl), 1,2,5-thiadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, 3- or 4-pyridazinyl, pyrazinyl, N-oxido-3- or 4-pyridazinyl, benzofuryl, benzothiazolyl, benzoxazolyl, triazinyl, oxotriazinyl, tetrazolo[1,5-b]-pyridazinyl, triazolo[4,5-b]pyridazinyl, oxoimidazinyl, dioxotriazinyl, pyrrolidinyl, piperidinyl, pyranyl, thiopyranyl, 1,4-oxazinyl, morpholinyl, 1,4-thiazinyl, 1,3-thiazinyl, piperazinyl, benzimidazolyl, quinolyl, isoquinolyl, cinnolinyl, phthalazinyl, quinazolinyl, quinoxalinyl, indolizinyl, quinolizinyl, 1,8-naphthyridinyl, purinyl, pteridinyl, dibenzofuranyl, carbazolyl, acridinyl, phenanthridinyl, phenazinyl, phenothiazinyl or phenoxyazinyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl, halo-C_{1-4} alkyl, C_{1-4} alkoxy, halo-C_{1-4} alkoxy, C_{1-4} alkylthio or halo-C_{1-4} alkylthio or a salt thereof.

5. A compound as claimed in claim 1, wherein,

X^1 is nitro;

X^2 is hydrogen or C_{1-2} alkylsulfonylthiocarbamoyl;

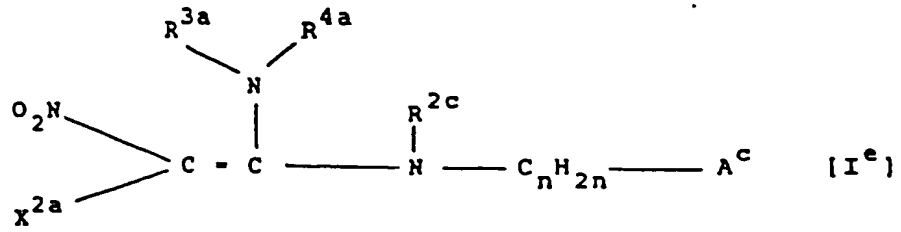
R^1 is amino, mono- or di-C_{1-2} alkylamino, halo-C_{1-2} alkylamino, N-C_{1-2} alkyl-N-C_{1-2} alkanoylamino, N-halo-C_{1-2} alkyl-N-C_{1-2} alkanoylamino or C_{1-2} alkanoylamino;

R^2 is hydrogen, C_{1-2} alkoxy, di-C_{1-2} alkylamino, C_{1-4} alkyl, halo-C_{1-4} alkyl or C_{1-2} alkanoyl;

n is 1; and

A^c is pyridyl, pyrazinyl or thiazolyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl, halo-C_{1-4} alkyl, C_{1-4} alkoxy, halo-C_{1-4} alkoxy, C_{1-4} alkylthio or halo-C_{1-4} alkylthio or a salt thereof.

6. A compound as claimed in claim 1, of the formula



[I^e]

wherein:

X^{2a} is hydrogen, C_{1-4} alkoxycarbonyl or C_{1-4} alkylsulfonylthiocarbamoyl;

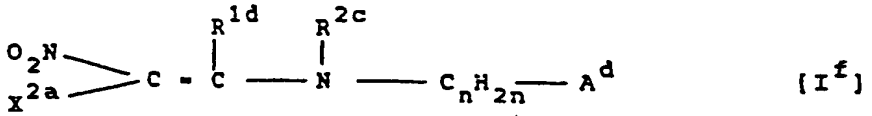
R^{2c} is hydrogen, C_{1-3} alkanoyl, C_{1-4} alkyl, mono- or di-C_{1-4} alkoxy-C_{1-4} alkyl, C_{7-9} aralkyl, mono- or di-C_{1-4} alkylamino or C_{1-4} alkoxy;

A^c is 3- or 4-pyridyl, pyrazinyl or 4- or 5-thiazolyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy;

n is 1; and

R^{3a} and R^{4a} are as defined in claim 1 , or a salt thereof.

7. A compound as claimed in claim 1, which is a compound of the formula:



[I^f]

wherein:

X^{2a} is hydrogen, C_{1-4} alkoxycarbonyl or C_{1-4} alkylsulfonylthiocarbamoyl;

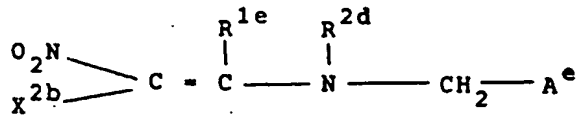
R^{1d} is amino, mono- or di-C_{1-4} alkylamino, N-C_{1-4} alkyl-N-C_{1-3} alkanoylamino C_{7-9} aralkylamino, halogenothiazolyl-C_{1-2} alkylamino or C_{1-4} alkoxy-C_{1-2} alkylamino;

R^{2c} is hydrogen, C_{1-3} alkanoyl, C_{1-4} alkyl, mono- or di-C_{1-4} alkoxy-C_{1-4} alkyl, C_{7-9} aralkyl, mono- or di-C_{1-4} alkylamino or C_{1-4} alkoxy;

n is 0, 1 or 2; and

A^d is 3- or 4-pyridyl, pyrazinyl or 5-thiazolyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy, or a salt thereof.

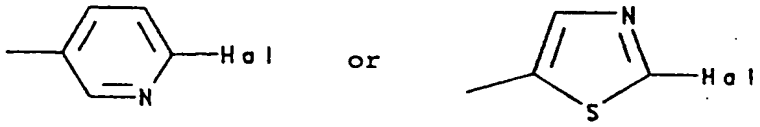
8. A compound as claimed in claim 1, which is a compound of the formula:



[I^g]

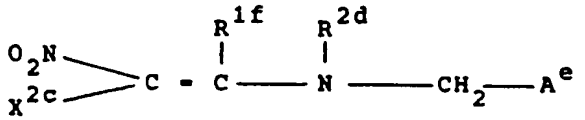
wherein:

X^{2b} is hydrogen or C_{1-2} alkylsulfonylthiocarbamoyl;
R^{1e} is amino, mono- or di-C_{1-2} alkylamino or N-C_{1-2} alkyl-N-formylamino;
R^{2d} is hydrogen, C_{1-2} alkyl or C_{1-3} alkanoyl; and
A^e is a group of the formula:



wherein Hal is a halogen atom, or a salt thereof.

9. A compound as claimed in claim 1, which is a compound of the formula:



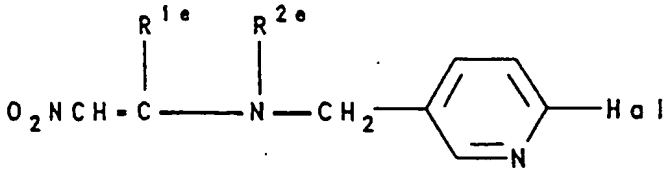
[I^h]

wherein:

X^{2c} is hydrogen or methylsulfonylthiocarbamoyl;
R^{1f} is amino, methylamino, dimethylamino or N-methyl-N-formylamino;
R^{2d} is a hydrogen atom, formyl or C_{1-2} alkyl; and
A^e is a group of the formula:

wherein Hal is a halogen atom, or a salt thereof.

10. A compound as claimed in claim 1, which is a compound of the formula:



[I^i]

wherein:

R^{1e} is amino, mono- or di-C_{1-2} alkylamino or N-C_{1-2} alkyl-N-formylamino;

R^{2e} is C_{1-2} alkyl or formyl; and

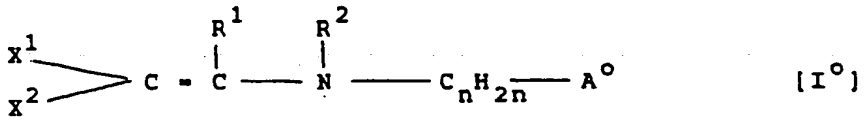
Hal is a halogen atom, or a salt thereof.

11. A compound as claimed in claim 1, wherein the heterocycle is selected from the following group and being optionally substituted as defined in claim 1, the group consisting of 2- or 3-thienyl, 2- or 3-furyl, 2- or 3- pyrrolyl, 2-, 4- or 5-oxazolyl, 2-, 4- or 5-thiazolyl, 3-, 4- or 5-pyrazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-isoxazolyl, 3-, 4- or 5-isothiazolyl, 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 4- or 5-(1,2,3-thiadiazolyl), 1,2,5-thiadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, 3- or 4-pyridazinyl, pyrazinyl, N-oxido-3- or 4-pyridazinyl, benzofuryl, benzothiazolyl, benzoxazolyl, triazinyl, oxotriazinyl, tetrazolo[1,5-b]pyridazinyl, triszolo[4,5-b]pyridazinyl, oxoimidazinyl, dioxotriazinyl, pyrrolidinyl, piperidinyl, pyranyl, thiopyranyl, 1,4-oxazinyl, morpholinyl, 1,4-thiazinyl, 1,3-thiazinyl, piperazinyl, benzimidazolyl, quinolyl, isoquinolyl, cinnolinyl, phthalazinyl, quinazolinyl, quinoxalinyl, indolizinyl, quinolizinyl, 1,8-naphthyridinyl, purinyl, pteridinyl, dibenzofuranyl, carbazolyl, acridinyl, phenanthridinyl, phenazinyl, phenothiazinyl and phenoxazinyl.

12. A compound as claimed in claim 1, selected from 1-[N-(6-chloro-3-pyridylmethyl)-N-methyl]amino-1-methylamino-2-nitroethylene, 1-(6-chloro-3-pyridylmethyl)amino-1-dimethylamino-2-nitroethylene, and 1-[N-(6-chloro-3-pyridylmethyl)-N-ethyl]amino-1-methylamino-2-nitroethylene.

13. An insecticidal/miticidal composition which comprises an insecticidal/miticidal effective amount of at least one of the α-unsaturated amines as claimed in any one of claims 1 to 12, or a salt thereof, together with a suitable carrier or carriers.

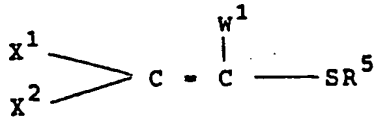
14. A process for preparing an α-unsaturated amine of the formula:



[I^o]

wherein the symbols are as defined in claim 1 or a salt thereof, which comprises

(1) reacting a compound of the formula:

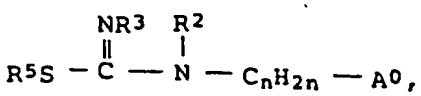


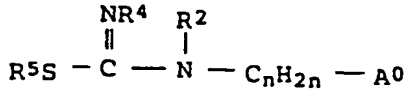
or a salt thereof with a compound of the formula:

Y - W^2

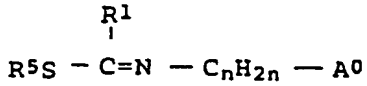
or a salt thereof, or

(2) reacting a compound of the formula:

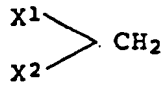




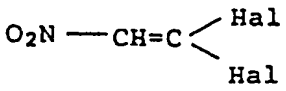
or



or a salt thereof with a compound of the formula:



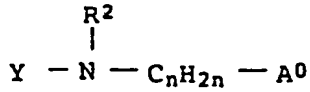
or a salt thereof, or
(3) reacting a compound of the formula:



or

O_2N - $CH_2C(Hal)_3$

(i) with a compound of the formula:



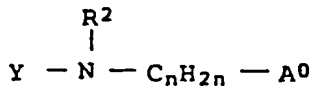
or a salt thereof, and then reacting the resulting product with a compound of the formula:

R^1 - Y

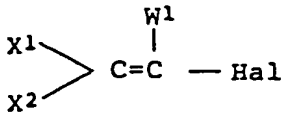
or a salt thereof, or (ii) with a compound of the formula:

R^1 - Y

or a salt thereof, and then reacting the resulting product with a compound of the formula:



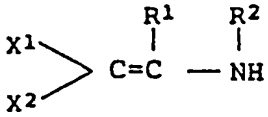
or a salt thereof, or
(4) reacting a compound of the formula:



or a salt thereof with a compound of the formula:

$Y - W^2$

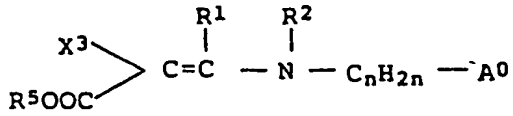
or a salt thereof, or
(5) reacting a compound of the formula:



or a salt thereof with a compound of the formula:

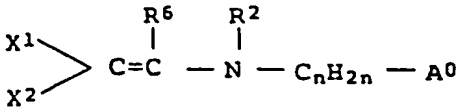
$A^0 - C_nH_{2n} - Hal$

or a salt thereof, or
(6) subjecting a compound of the formula:

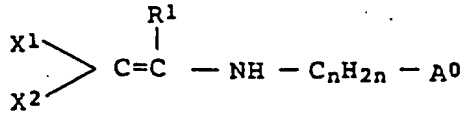


or a salt thereof to hydrolysis reaction and then to decarboxylation reaction, or

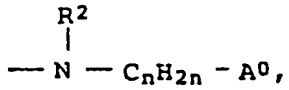
(7) subjecting a compound of the formula:



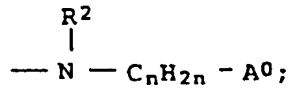
or



or a salt thereof to alkylation, acylation, alkoxycarbonylation, sulfonylation or phosphorylation, in which formulas, R^5 is a C_{1-4} alkyl or aralkyl; when W^1 is



W^2 is R^1 and when W^1 is R^1, W^2 is



Y is a hydrogen atom or an alkali metal;
R^3 is a hydrogen atom, alkyl, aryl aralkyl, heterocyclic, acyl, alkoxycarbonyl, aryloxycarbonyl, heterocycleoxycarbonyl, arylsulfonyl, alkylsulfonyl, dialkoxyphosphoryl, alkoxy, hydroxyl, amino, dialkylamino, acylamino, alkoxycarbonylamino, alkylsulfonylamino, dialkoxyphosphorylamino, aralkyloxy or alkoxycarbonylalkyl; R^4 is a hydrogen atom, or alkyl, cycloalkyl, alkenyl, cycloalkenyl or alkynyl which groups may optionally be substituted, or pyridyl- or thiazolyl-C_{1-2} alkyl wherein pyridyl and thiazolyl moiety may optionally be substituted with a halogen atom; Hal is a halogen atom;
X^3 is an electron-attracting group; R^6 is a group attached through a nitrogen atom containing at least one hydrogen atom; and X^1, X^2, R^1, R^2, n and A^0 are as defined in claim 1.

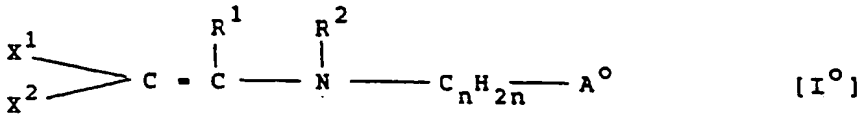
15. A method of combatting undesirable insects or mites, which comprises applying an insecticidal or miticidal effective amount of the compound of the formula [I°] defined in any one of claims 1 to 12 or a salt thereof to the said insects or mites or their habitat.

16. A method of claim 15, wherein the compound or salt is applied in a composition of the compound or salt with a suitable carrier or carriers.

17. A method of combatting undesirable insects or mites, which comprises applying an insecticidal or miticidal effective amount of the compound of the formula [I°] defined in claim 12.

Claims for the following Contracting State : ES

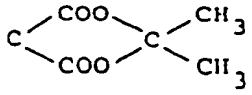
1. A process for preparing an α-unsaturated amine of the formula:



[I°]

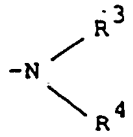
wherein:

one or X^1 and X^2 is an electron-attracting group and the other is a hydrogen atom or an electron-attracting group, wherein the said electron-attracting group is cyano, nitro, C_{1-4} alkoxy carbonyl, carboxyl, C_{6-10} aryloxy-carbonyl, heterocycleoxycarbonyl, C_{1-4} alkylsulfonyl which may be substituted with halogen, aminosulfonyl, di-C_{1-4} alkoxyphosphoryl, C_{1-4} alkanoyl which may be substituted with halogen, C_{1-4} alkylsulfonylthiocarbamoyl, carbamoyl or halogen, or X^1 and X^2 together with the carbon atom to which they are attached form a ring of the formula:



;

R^1 is a group of the formula:

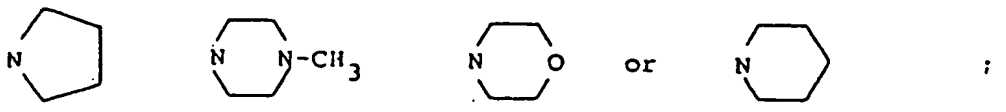


in which:

R^3 is hydrogen, C_{1-20} alkyl, C_{6-10} aryl, C_{7-9} aralkyl, heterocycle, C_{1-4} alkanoyl, C_{6-10} aryl-carbonyl, C_{1-4} alkoxy-carbonyl, C_{6-10} aryloxy-carbonyl, heterocycleoxycarbonyl, C_{6-10} arylsulfonyl, C_{1-4} alkylsulfonyl, di-C_{1-4} alkoxyphosphoryl, C_{1-4} alkoxy, hydroxy, amino, di-C_{1-4} alkylamino, C_{1-4} alkanoylamino, C_{1-4} alkoxycarbonylamino, C_{1-4} alkylsulfonylamino, di-C_{1-4} alkoxyphosphorylamino, C_{7-9} aralkyloxy or C_{1-4} alkoxy-carbonyl-C_{1-4} alkyl; and

R^4 is hydrogen, C_{1-20} alkyl, C_{3-6} cycloalkyl, C_{2-6}-alkenyl, C_{3-6} cycloalkenyl or C_{2-6} alkynyl, wherein each of the radicals defined for R^4 except for hydrogen may optionally be substituted by 1 to 3 substituents selected from the group consisting of hydroxy, C_{1-4} alkoxy, lialogen, di-C_{1-4} alkylamino, C_{1-4} alkylthio, C_{1-3} alkanoylamino, C_{1-4} alkylsulfonylamino, tri-C_{1-4} alkylsilyl, pyridyl and thiazolyl, and each of the pyridyl and thiazolyl may further be substituted by halogen, or

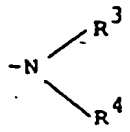
R^3 and R^4 together with the adjacent nitrogen atom constitute a cyclic amino group of the formula:



;

R^2 is (1) hydrogen, (2) a group attached through a carbon atom selected from the class consisting of C_{1-4} alkanoyl, C_{1-20} alkyl, C_{2-6} alkenyl, C_{3-6} cycloalkyl, C_{6-10} aryl, C_{7-9} aralkyl and 3- or 4-pyridyl, the said group attached through a carbon atom being optionally substituted by 1 to 3 substituents selected from the class consisting of C_{1-4} alkylthio, C_{1-4} alkoxy, mono-or di-C_{1-4} alkylamino, C_{1-4} alkoxy-carbonyl, C_{1-4} alkylsulfonyl, halogen and C_{1-4} alkanoyl, (3) a group attached

through an oxygen atom selected from the class consisting of C_{1-4} alkoxy, C_{3-6} cycloalkoxy, C_{2-4} alkenyloxy, C_{3-6} cycloalkenyloxy, ethynyloxy, C_{6-10} aryloxy, thienyloxy and hydroxy, the said group attached through an oxyyen atom being optionally substituted by 1 to 3 substituents selected from the class consisting of halogen and phenyl, or (4) a group attached through a nitrogen atom of the formula:



wherein R^3 and R^4 have the meanings given above;

n is an integer of 0, 1 or 2;

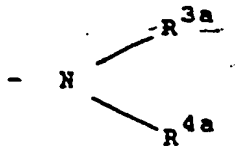
$\bar{A}^o$ is heterocycle,

wherein the heterocycle in the said heterocycle carbonyl for X^1 and X^2, the said heterocycle for R^3, the heterocycle in the said heterocycleoxycarbonyl for R^3,

and the said heterocycle for A^o are a member selected from the class consisting of thienyl, furyl, pyrrolyl, pyridyl, oxazolyl, thiazolyl, pyrazolyl, imidazolyl, isoxazolyl, isothiazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, N-oxidopyridyl, pyrimidinyl, N-oxidopyrimidinyl, pyridazinyl, pyrazinyl, N-oxidopyridazinyl, benzofuryl, benzothiazolyl, benzoxazolyl, triazinyl, oxotriazinyl, tetrazo[1,5-b]-pyridazinyl, triazolo[4,5-b]pyridazinyl, oxoimidazinyl, dioxotriazinyl, pyrrolidinyl, piperidinyl, pyranyl, thiopyranyl, 1,4-oxazinyl, morpholinyl, 1,4-thiazinyl, 1,3-thiazinyl, piperazinyl, benzimidazolyl, quinolyl, isoquinolyl, indolizinyl, quinolizinyl, 1,8-naphthyridinyl, purinyl, pteridinyl, dibenzofuranyl, carbazolyl, acridinyl, phenanthridinyl, phenazinyl, phenothiazinyl and phenoxazinyl, the said heterocycle being optionally substituted by 1 to 5 substituents selected from the group consisting of,

(i) C_{1-4} alkyl,
(ii) C_{3-6} cycloalkyl,
(iii) C_{6-10} aryl,
(iv) C_{1-4} alkoxy,
(v) C_{3-6} cycloalkyloxy,
(vi) C_{6-10} aryloxy,
(vii) C_{7-12} aralkyloxy
(viii) C_{1-4} alkylthio,
(ix) C_{3-6} cycloalkylthio,
(x) C_{6-10} arylthio,
(xi) C_{7-12} aralkylthio,
(xii) mono-C_{1-4} alkylamino,
(xiii) di-C_{1-4} alkylamino,
(xiv) C_{3-6} cycloalkylamino,
(xv) C_{6-10} arylamino,
(xvi) C_{7-12} aralkylamino,
(xvii) halogen,
(xviii) C_{1-4} alkoxycarbonyl,
(xix) C_{6-10} aryloxycarbonyl,
(xx) C_{3-6} cycloalkyloxycarbonyl,
(xxi) C_{7-12} aralkyloxycarbonyl,
(xxii) C_{1-5} alkanoyl,
(xxiii) C_{1-15} alkanoyloxy,
(xxiv) carbamoyl, N-methylcarbamoyl, N,N-dimethylcarbamoyl, N-ethylcarbamoyl, N,N-diethylcarbamoyl N-phenylcarbamoyl, pyrrolidinocarbamoyl, piperidinocarbamoyl, piperazinocarbamoyl, morpholinocarbamoyl or N-benzylcarbarmoyl,
(xxv) N-methylcarbamoyloxy, N,N-dimethylcarbamoyloxy, N-ethylcarbamoyloxy, N-benzylcarbamoyloxy, N,N-dibenzylcarbamoyloxy or N-phenylcarbamoyloxy,
(xxvi) C_{1-4} alkanoylamino,
(xxvii) C_{6-10} arylcarbonylamino,
(xxviii) C_{1-4} alkoxycarbonylamino,

(xxix) C_{7-12} aralkyloxycarbonyl,
(xxx) methanesulfonylamino, ethanesulfonylamino, butanesulfonylamino, benzenesulfonylamino, toluenesulfonylamino, naphthalenesulfonylamino, trifluoromethanesulfonylamino, 2-chloroethanesulfonylamino or 2,2,2-trifluoromethanesulfonylamino,
(xxxi) pyrrolidinyl, pyrrolyl, pyrazolyl, imidazolyl, furyl, thienyl, oxazolyl, isoxazolyl, isothiazolyl, thiazolyl, piperidinyl, pyridyl, piperazinyl, pyrimidinyl, pyranyl, tetrahydropyranyl, tetrahydrofuryl, indolyl, quinolyl, 1,3,4-oxadiazolyl, thieno[2,3-d]pyridyl, 1,2,3-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,3,4-triazolyl, tetrazolyl, 4,5-dihydro-1,3-dioxazolyl, tetrazolo[1,5-b]-pyridazinyl, benzothiazolyl, benzoxazolyl, benzimidazolyl or benzothienyl,
(xxxii) heterocyclethio, heterocycleoxy, heterocycleamino or heterocyclecarbonylamino group which is derived by attachment of any of the heterocyclic groups (xxxi) defined above to the S, O, N atom or a carbonylamino group,
(xxxiii) di-C_{1-4} alkylphosphinothioylamino,
(xxxiv) methoxyimino, ethoxyimino, 2-fluoroethoxyimino, carboxymethoxyimino, 1-carboxy-1-methylethoxyimino, 2,2,2-trichloroethoxycarbonylmethoxyimino, 1-(2,2,2-trichloroethoxycarbonyl)-1-methylethoxyimino, (2-aminothiazol-4-yl)methoxyimino or (1H-imidazol-4-yl)methoxyimino,
(xxxv) C_{1-4} alkylsulfonyloxy,
(xxxvi) C_{6-10} arylsulfonyloxy,
(xxxvii) di-C_{6-10} arylphosphino-thioylamino,
(xxxviii) thiocarbamoylthio, N-methylthiocarbamoylthio, N,N-dimethylthiocarbamoylthio, N-ethylthiocarbamoylthio, N-benzylthiocarbamoylthio, N,N-dibenzylthiocarbamoylthio or N-phenylthiocarbamoylthio,
(xxxix) trimethylsilyloxy, t-butyldimethylsilyloxy, t-butyldiphenylsilyloxy or dimethylphenylsilyloxy,
(xL) trimethylsilyl, t-butyldimethylsilyl, t-butyldiphenylsilyl or dimethylphenylsilyl,
(xLi) C_{1-4} alkylsulfinyl,
(xLii) C_{6-10} arylsulfinyl,
(xLiii) C_{1-4} alkylsulfonyl,
(xLiv) C_{6-10} arylsulfonyl,
(xLv) C_{1-4} alkoxy-carbonyloxy,
(xLvi) halo-C_{1-4} alkyl,
(xLvii) halo-C_{1-4} alkoxy, halo-C_{1-4} alkylthio, halo-C_{1-4} alkylsulfinyl or halo-C_{1-4} alkylsulfonyl,
(xLviii) cyano, nitro, hydroxyl, carboxyl, sulfo, phosphono,
(xLix) C_{1-4} alkyloxysulfonyl,
(L) C_{6-10} aryloxysulfonyl,
(Li) C_{7-12} aralkyloxysulfonyl, and
(Lii) di-C_{1-4} alkyloxyphosphoryl group, with the proviso that when R^2 is a hydrogen atom, R^1 is a group of the formula,

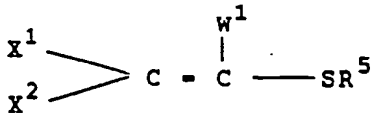


[wherein R^{3a} is hydrogen, C_{1-4} alkyl, C_{7-9} phenylalkyl or C_{1-4} alkanoyl and R^{4a} is a hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy-C_{1-4} alkyl, (di-C_{1-4} alkylamino)-C_{1-4} alkyl, tri-C_{1-4} alkylsilyl-C_{1-4} alkyl, C_{2-4} alkenyl or pyridyl- or thiazolyl-C_{1-2} alkyl wherein pyridyl or thiazolyl moiety may optionally be substituted with a halogen atom, or R^{3a} and R^{4a} taken together with the adjacent nitrogen atom constitute pyrrolidino] and A^o is pyridyl, pyrazinyl or thiazolyl, each of which may optionally be substituted with a halogen, C_{1-4} alkyl, C_{1-4} alkylthio or C_{1-4} alkoxy), and with the proviso that when

is O_2N-CH=;
R^1 is

$$-\underset{\displaystyle R^4}{\overset{\displaystyle |}{N}}-R^3 \quad ;$$

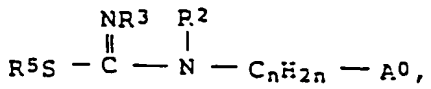
R^3 is hydrogen, C_{1-5} alkyl or C_{3-6} cycloalkyl;
R^4 is hydrogen, C_{1-5} alkyl, C_{3-6} cycloalkyl, benzyl or pyrimidinylmethyl; or
R^3 and R^4 together with the adjacent nitrogen atom constitute a cyclic amino group of pyrrolidinyl or piperazinyl; and
R^2 is hydrogen, C_{1-5} alkyl or C_{3-6} cycloalkyl,
A^0 is not a pyridyl subsituted by C_{1-4} haloalkyl, C_{1-4} haloalkoxy,
C_{1-4} haloalkylthio, C_{1-4} haloalkylsulfinyl, C_{1-4} haloalkylsulfonyl, cyano, nitro or hydroxyl,
or a salt thereof,
which comprises
(1) reacting a compound of the formula:

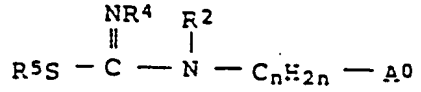


or a salt thereof with a compound of the formula:

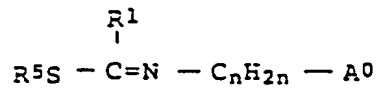
$Y - W^2$

or a salt thereof, or
(2) reacting a compound of the formula:

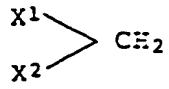




or

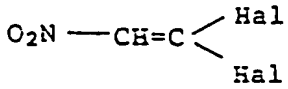


or a salt thereof with a compound of the formula:



or a salt thereof, or

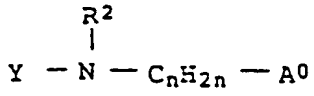
(3) reacting a compound of the formula:



or

O_2N - $CH_2C(Hal)_3$

(i) with a compound of the formula:



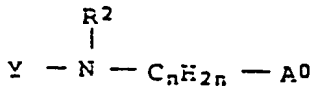
or a salt thereof, and then reacting the resulting product with a compound of the formula:

R^1 - Y

or a salt thereof, or (ii) with a compound of the formula:

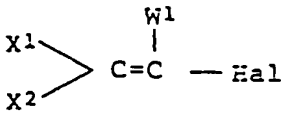
R^1 - Y

or a salt thereof, and then reacting the resulting product with a compound of the formula:



or a salt thereof, or

(4) reacting a compound of the formula:

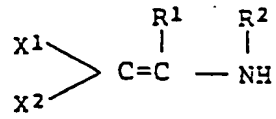


or a salt thereof with a compound of the formula:

Y - W^2

or a salt thereof, or

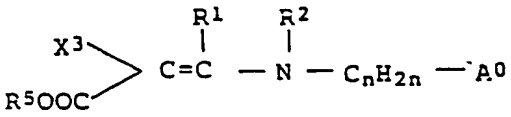
(5) reacting a compound of the formula:



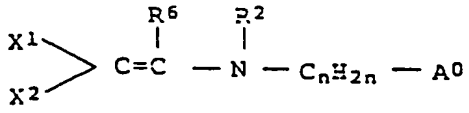
or a salt thereof with a compound of the formula:

$A^0 - C_nH_{2n} - Hal$

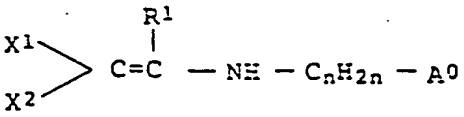
or a salt thereof, or
(6) subjecting a compound of the formula:



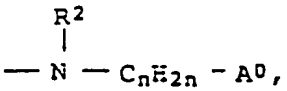
or a salt thereof to hydrolysis reaction and then to decarboxylation reaction, or
(7) subjecting a compound of the formula:



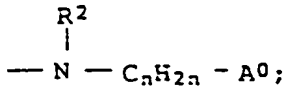
or



or a salt thereof to alkylation, acylation, alkoxycarbonylation, sulfonylation or phosphorylation, in which formulas, R^5 is a C_{1-4} alkyl or aralkyl; when W^1 is



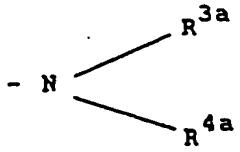
W^2 is R^1 and when W^1 is R^1, W^2 is



Y is a hydrogen atom or an alkali metal;
R^3 is a hydrogen atom, alkyl, aryl aralkyl, heterocyclic, acyl, alkoxycarbonyl, aryloxycarbonyl,

heterocycleoxycarbonyl, arylsulfonyl, alkylsulfonyl, dialkoxyphosphoryl, alkoxy, hydroxyl, amino, dialkylamino, acylamino, alkoxycarbonylamino, alkylsulfonylamino, dialkoxyphosphorylamino, aralkyloxy or alkoxycarbonylalkyl; R^4 is a hydrogen atom, or alkyl, cycloalkyl, alkenyl, cycloalkenyl or alkynyl which groups may optionally be substituted, or pyridyl- or thiazolyl-C_{1-2} alkyl wherein pyridyl and thiazolyl moiety may optionally be substituted with a halogen atom; Hal is a halogen atom;
X^3 is an electron-attracting group; R^6 is a group attached through a nitrogen atom containing at least one hydrogen atom; and X^1, X^2, R^1, R^2, n and A^0 are defined as above.

2. A process as claimed in claim 1, wherein R^2 is hydrogen, R^1 is a group of the formula:



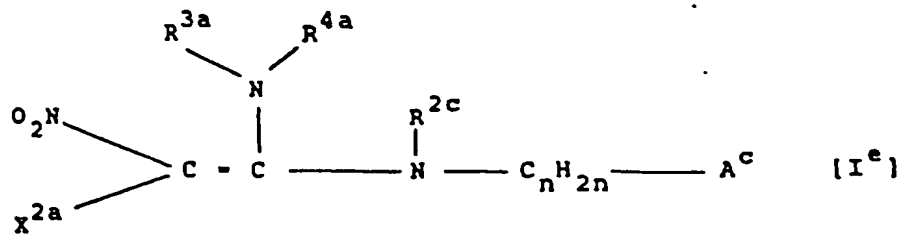
(wherein R^{3a} and R^{4a} are as defined in claim 1) and A^0 is heterocycle selected from the class consisting of pyridyl, pyrazinyl and thiazolyl, the said heterocycle mentioned just above for A^0 being optionally substituted with halogen, C_{1-4} alkyl, C_{1-4} alkylthio or C_{1-4} alkoxy.

3. A process as claimed in claim 1, wherein R^2 in other than hydrogen.

4. A process as claimed in claim 1, wherein:
X^1 is nitro;
X^2 is hydrogen, C_{1-2} alkoxycarbonyl or C_{1-2} alkylsulfonylthiocarbamoyl;
R^1 is amino, mono- or di-C_{1-4} alkylamino, halo-C_{1-4} alkylamino, N-C_{1-4} alkyl-N-C_{1-2} alkanoylamino, N-halo-C_{1-4} alkyl-N-C_{1-2} alkanoylamino or C_{1-2} alkanoylamino;
R^2 is hydrogen, C_{1-2} alkoxy, di-C_{1-2} alkylamino, C_{1-4} alkyl, halo-C_{1-4} alkyl or C_{1-2} alkanoyl;
n is 0 or 1;
A^0 is 2- or 3-thienyl, 2- or 3-furyl, 2- or 3-pyrrolyl, 2-, 3- or 4-pyridyl, 2-, 4- or 5-oxazolyl, 2-, 4- or 5-thiazolyl, 3-, 4- or 5-pyrazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-isoxazolyl, 3-, 4- or 5-isothiazolyl, 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 4- or 5-(1,2,3-thiadiazolyl), 1,2,5-thiadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, 3- or 4-pyridazinyl, pyrazinyl, N-oxido-3- or 4-pyridazinyl, benzofuryl, benzothiazolyl, benzoxazolyl, triazinyl, oxotriazinyl, tetrazolo[1,5-b]-pyridazinyl, triazolo[4,5-b]pyridazinyl, oxoimidazinyl, dioxotriazinyl, pyrrolidinyl, piperidinyl, pyranyl, thiopyranyl, 1,4-oxazinyl, morpholinyl, 1,4-thiazinyl, 1,3-thiazinyl, piperazinyl, benzimidazolyl, quinolyl, isoquinolyl, cinnolinyl, phthalazinyl, quinazolinyl, quinoxalinyl, indolizinyl, quinolizinyl, 1,8-naphthyridinyl, purinyl, pteridinyl, dibenzofuranyl, carbazolyl, acridinyl, phenanthridinyl, phenazinyl, phenothiazinyl or phenoxyazinyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl, halo-C_{1-4} alkyl, C_{1-4} alkoxy, halo-C_{1-4} alkoxy, C_{1-4} alkylthio or halo-C_{1-4} alkylthio or a salt thereof.

5. A as claimed in claim 1, wherein:
X^1 is nitro;
X^2 is hydrogen or C_{1-2} alkylsulfonylthiocarbamoyl;
R^1 is amino, mono- or di-C_{1-2} alkylamino, halo-C_{1-2} alkylamino, N-C_{1-2} alkyl-N-C_{1-2} alkanoylamino, N-halo-C_{1-2} alkyl-N-C_{1-2} alkanoylamino or C_{1-2} alkanoylamino;
R^2 is hydrogen, C_{1-2} alkoxy, di-C_{1-2} alkylamino, C_{1-4} alkyl, halo-C_{1-4} alkyl or C_{1-2} alkanoyl;
n is 1; and
A^0 is pyridyl, pyrazinyl or thiazolyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl, halo-C_{1-4} alkyl, C_{1-4} alkoxy, halo-C_{1-4} alkoxy, C_{1-4} alkylthio or halo-C_{1-4} alkylthio or a salt thereof.

6. A process as claimed in claim 1 for preparing a compound of the formula



[I^e]

wherein:

X^{2a} is hydrogen, C_{1-4} alkoxycarbonyl or C_{1-4} alkylsulfonylthiocarbamoyl;

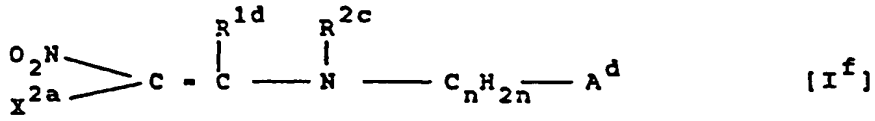
R^{2c} is hydrogen, C_{1-3} alkanoyl, C_{1-4} alkyl, mono- or- di-C_{1-4} alkoxy-C_{1-4} alkyl, C_{7-9} aralkyl, mono- or di-C_{1-4} alkylamino or C_{1-4} alkoxy;

A^c is 3- or 4-pyridyl, pyrazinyl or 4- or 5-thiazolyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy;

n is 1; and

R^{3a} and R^{4a} are as defined in claim 1 , or a salt thereof.

7. A process as claimed in claim 1 for preparing a compound of the formula:



[I^f]

wherein:

X^{2a} is hydrogen, C_{1-4} alkoxycarbonyl or C_{1-4} alkylsulfonylthiocarbamoyl;

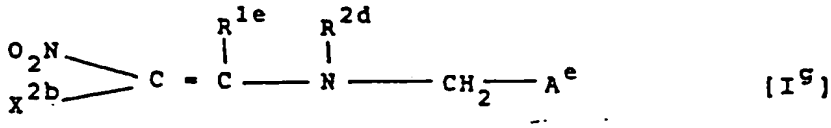
R^{1d} is amino, mono- or di-C_{1-4} alkylamino, N-C_{1-4} alkyl-N-C_{1-3} alkanoylamino C_{7-9} aralkylamino, halogenothiazolyl-C_{1-2} alkylamino or C_{1-4} alkoxy-C_{1-2} alkylamino;

R^{2c} is hydrogen, C_{1-3} alkanoyl, C_{1-4} alkyl, mono- or di-C_{1-4} alkoxy-C_{1-4} alkyl, C_{7-9} aralkyl, mono- or di-C_{1-4} alkylamino or C_{1-4} alkoxy;

n is 0, 1 or 2; and

A^d is 3- or 4-pyridyl, pyrazinyl or 5-thiazolyl, each of which may optionally be substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy, or a salt thereof.

8. A process as claimed in claim 1 for preparing a compound of the formula:



[I^g]

wherein:

X^{2b} is hydrogen or C_{1-2} alkylsulfonylthiocarbamoyl;

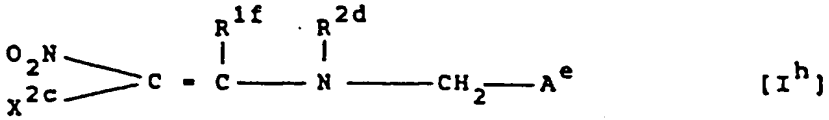
R^{1e} is amino, mono- or di-C_{1-2} alkylamino or N-C_{1-2} alkyl-N-formylamino;

R^{2d} is hydrogen, C_{1-2} alkyl or C_{1-3} alkanoyl; and

A^e is a group of the formula:

wherein Hal is a halogen atom , or a salt thereof.

9. A process as claimed in claim 1 for preparing a compound of the formula:

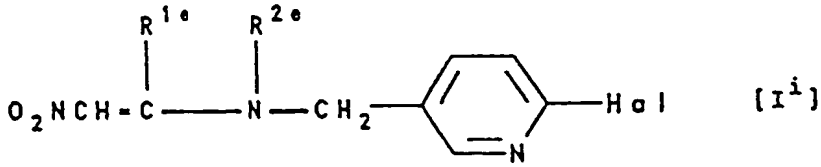


wherein:

X^{2c} is hydrogen or methylsulfonylthiocarbamoyl;
R^{1f} is amino, methylamino, dimethylamino or N-methyl-N-formylamino;
R^{2d} is a hydrogen atom, formyl or C_{1-2} alkyl; and
A^e is a group of the formula:

wherein Hal is a halogen atom, or a salt thereof.

10. A process as claimed in claim 1 for preparing a compound of the formula:



wherein:

R^{1e} is amino, mono- or di-C_{1-2} alkylamino or N-C_{1-2} alkyl-N-formylamino;
R^{2e} is C_{1-2} alkyl or formyl; and
Hal is a halogen atom , or a salt thereof.

11. A process as claimed in claim 1, wherein the heterocycle is selected from the following group and being optionally substituted as defined in claim 1, the group consisting of 2- or 3-thienyl, 2- or 3-furyl, 2- or 3- pyrrolyl, 2-, 4- or 5-oxazolyl, 2-, 4- or 5-thiazolyl, 3-, 4- or 5-pyrazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-isoxazolyl, 3-, 4- or 5-isothiazolyl, 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 4- or 5-(1,2,3-thiadiazolyl), 1,2,5-thiadiazolyl, 1;2,3-triazolyl, 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, 3- or 4-pyridazinyl, pyrazinyl, N-oxido-3- or 4-pyridazinyl, benzofuryl, benzothiazolyl, benzoxazolyl, triazinyl, oxotriazinyl, tetrazolo[1,5-b]pyridazinyl, triazolo[4,5-b]pyridazinyl, oxoimidazinyl, dioxotriazinyl, pyrrolidinyl, piperidinyl, pyranyl, thiopyranyl, 1,4-oxazinyl, morpholinyl, 1,4-thiazinyl, 1,3-thiazinyl, piperazinyl, benzimidazolyl, quinolyl, isoquinolyl, cinnolinyl, phthalazinyl, quinazolinyl, quinox-

alinyl, indolizinyl, quinolizinyl, 1,8-naphthyridinyl, purinyl, pteridinyl, dibenzofuranyl, carbazolyl, acridinyl, phenanthridinyl, phenazinyl, phenothiazinyl and phenoxazinyl.

12. A process as claimed in claim 1 for the preparation of a compound selected from 1-[N-(6-chloro-3-pyridylmethyl)-N-methyl]amino-1-methylamino-2-nitroethylene, 1-(6-chloro-3-pyridylmethyl)amino-1-dimethylamino-2-nitroethylene, and 1-[N-(6-chloro-3-pyridylmethyl)-N-ethyl]amino-1-methylamino-2-nitroethylene.

13. A process for preparing an insecticidal/miticidal composition which comprises mixing an insecticidal/miticidal effective amount of at least one of the α-unsaturated amines as prepared according to any one of claims 1 to 12, or a salt thereof, together with a suitable carrier or carriers.

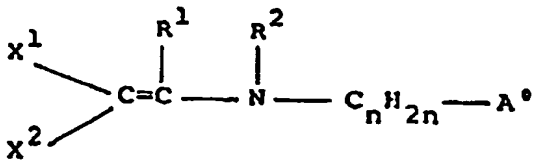
14. A method of combatting undesirable insects or mites, which comprises applying an insecticidal or miticidal effective amount of the compound of the formula [I•] prepared according to any one of claims 1 to 12 or a salt thereof to the said insects or mites or their habitat.

15. A method of claim 14, wherein the compound or salt is applied in a composition of the compound or salt with a suitable carrier or carriers.

Patentansprüche

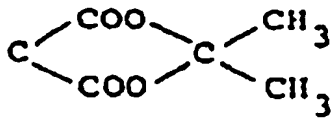
Patentansprüche für folgende Vertragsstaaten : AT, BE, CH, DE, FR, GB, GR, IT, LI, LU, NL, SE

1. α-Ungesättigtes Amin der Formel



[I•]

worin
eines von X^1 und X^2 eine elektronenanziehende Gruppe ist und das andere ein Wasserstoffatom oder eine elektronenanziehende Gruppe ist, in welcher die elektronenanziehende Gruppe Cyano, Nitro, C_{1-4}-Alkoxycarbonyl, Carboxy, C_{6-10}-Aryloxycarbonyl, Heterocyclyloxycarbonyl, C_{1-4}-Alkylsulfonyl, welches mit Halogen substituiert sein kann, Aminosulfonyl, Di-C_{1-4}-alkoxyphosphoryl, C_{1-4}-Alkanoyl, welches mit Halogen substituiert sein kann, C_{1-4}-Alkylsulfonylthiocarbamoyl, Carbamoyl oder Halogen ist, oder X^1 und X^2 zusammen mit dem Kohlenstoffatom, an welches sie gebunden sind, einen Ring der Formel



bilden;
R^1 eine Gruppe der Formel